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Original Article

Factors Associated with Depressive Mood in the Elderly Residing at the Long-Term Care Facilities☆

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SUMMARY

Background: Demands for long-term care facilities for the elderly increased rapidly due to longevity of the current population and a trend toward nuclear families with fewer offspring[1]. A study showed that the prevalence of depression is 8–15% and 30% among the community-dwelling and the institutionalized elderly[2], respectively, in the USA compared with 29.5% and 39.2% in Taiwan[3]. The major goal of this study was to investigate the prevalence of depression in the elderly residing at long-term care facilities in Taiwan, to explore the relationship between demographic characteristics, health status, social support, and the participation in leisure activities with the development of depression in the elderly, and finally to propose possible interventional items for clinical use and further interventional study design.
Methods: A cross-sectional survey of the elderly was conducted through interview using questionnaire. A total of 309 subjects, aged 65 and above, in six long-term care facilities were enrolled in this study. The questionnaire collected information on their characteristics, health condition, the level of social support and daily activity, and depression status.
Results: Thee prevalence of depression among the elderly residing at long-term care facilities was 37% in Taiwan, and self-funded elderly had a higher depression rate than those in government-sponsored facilities. Participants with advanced ages, religious practices, literacy, longer facility stay, better instrumental activities of daily living (IADLs), more leisure activities, and strong social support had lower association with depression. Factors strongly associated with depression included better self-assessed health status, ability to perform IADLs, level of social support (especially social companionship), and leisure-activity involvement.
Conclusion: We summarized the perceptions for preventing the elderly residing at facilities from developing depression, including increased interactions provided by caregivers, more family visits and social companionship, and more frequent leisure activities. Further interventional studies with a larger group of participants and longitudinal design should be conducted to confirm our recommendations.

1. Introduction

According to the annual report released by the Ministry of the Interior, the elderly population exceeded 2,400,000 in 2008, accounting for 10.4% of the total population in Taiwan[4]. The population aging index reached 61.5% in 2008 and is increasing year by year. Therefore, long-term care, including general medical care, individual daily care, and social services[5,6], is progressively becoming more important, with the related facilities becoming the major choice to take care of the elderly[7]. Institutionalized care aims at providing comprehensive care for mind, body, and spirit. However, most long-term care facilities fall short of providing sufficient activities and stimuli, including individualized services and recreational support, for the elderly[8,9]. In addition to providing basic care and medical care, current efforts of long-term care are to promote autonomy of the elderly through social and recreational activities[10,11].

The prevalence of depression in the elderly is high, especially for those who reside in long-term care facilities. However, most of

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them are not definitely diagnosed by medical professionals[2]. Depression occurs in 6–23.3% of the community-dwelling elderly and increases to 31.3–94.2% in those living in long-term care facilities (Wang YY. Investigation of the relationship between major depressions and illnesses in elderly males in a nursing home [unpublished master's thesis]. Institute of Behavioral Medicine, National Cheng Kung University, Tainan; 2006).

Factors associated with the development of depression in the elderly include impaired self-esteem, loss of loved ones, altered role performance, insufficient community involvement, declined body functions, financial difficulties, changes of the family structure, relocation distress, and impaired adaptation to the surroundings (Hwang LL. Physical, psychological, and society functions of the lone-living community-dwelling elderly [unpublished master's thesis]. Kaohsiung Medical University; 2000). Studies conclude that major factors significantly associated with depression are as follows:

(1) Demographic characteristics: advanced age[12,13], being female[14], low level of education, lower socioeconomic status[15], and lack of religious beliefs[16].
(2) Health condition: self-perception of poor health,[16] difficulty in performing daily activities (Han YL. Exploring symptoms of depression and related factors in the elderly in Peng-hu [unpublished master's thesis]. Graduate Institute of Nursing of Chung Shan Medical University, Pen-Hou; 2004), impaired cognitive abilities, disabilities, and higher morbidity rates (Chen PY. Relationship between functional abilities, stress levels, and social support and elderly depression [unpublished Master's thesis]. Department of Psychology, Chung Yuan Christian University, Taoyuan; 2001).
(3) Social network: insufficient emotional support, deficiency in information exchange, and inadequate instrumental support[3].

This was a cross-sectional study derived from questionnaire investigation. The major goals of this study were to investigate the prevalence of depression in the elderly residing in long-term care facilities in Taiwan; to explore the relationship between demographic characteristics, health status, social support, and the participation in leisure activities with the development of depression in the elderly; and finally to propose possible interventional items for clinical use and further interventional study design.

2. Materials and methods

2.1. Participants and questionnaires

Research participants were recruited through purposive sampling from six long-term care facilities in Taipei city and Taipei County. All the institutions were approved by the government and have been in operation for more than 1 year. A total of 309 participants, aged $\geq$65 years and capable of answering questions clearly, were interviewed. The structured questionnaire consisted of two major categories:

(1) Demographic characteristics: gender, age, birthplace, level of education, religious beliefs, marital status, economic conditions, duration of stay in the long-term care facilities.
(2) Health status: self-assessed health status (SAHS)[17,18], cognitive function scale (the Short Portable Mental Status Questionnaire, SPMSQ)[19], activities of daily living scale (Barthel Index)[20], Older Americans Resource Scale for Instrumental Activities of Daily Living (OARS-IADL)[21,22], depression scale [Center for Epidemiologic Studies Depression Scale (CES-D)][23–26], social support scale (Hwang WL. Exploring depression in public-sponsored elderly in long-term care facilities and their sleep qualities [unpublished master's thesis]. Graduate Institute of Nursing of Chang Gung University, Taoyuan; 2004, and Chen YH. Direct and indirect influence of social support on depression in middle-age or elderly adults with disabilities [unpublished master's thesis]. Graduate Institute of Public Health of Taipei Medical University; 2002)[27,28], and leisure-activity participation scale[29].

The SAHS questionnaire measures general health and well-being, and produces scores for dimensions of health. The Barthel Index examines functional independence in personal care and mobility. It is used to monitor pre- and post-treatment performance in long-term hospital patients with chronic paralytic conditions, and to assess the nursing care required. The IADL scale is used to assess independent living skills of an individual and to measure functional abilities as well as their declines and improvements over time. This test consists of questions and other tests to measure short- and long-term memory, orientation, basic knowledge, and mathematical skills. Answers are identified as correct if all parts are correct since some questions are combined, i.e., month, day, and year. The CES-D is a 20-item self-report questionnaire developed to identify depression symptoms or psychologic distress of the general population. It was designed to gauge the major components of depression, including depressed mood, feelings of guilt and worthlessness, feelings of helplessness, psychomotor retardation, loss of appetite, and sleep disorders. Twenty items are included in the CES-D scale and each is scored by a four-point Likert-type scale. Social support scale consisted of one self-report questionnaire with 10 questions for assessing emotional, instrumental, and informational support, and positive social interaction. Leisure-activity participation was scored by two questionnaires that include 33 questions for evaluating participation and 19 questions for leisure constraints. Survey questionnaires consisting of 33 items that participants rate on a five-point Likert-type scale were released by Taiwan's government in 1999 (Bureau of Health, Executive Yuan).

All these instruments are widely applied for long-term care residents. The validity and reliability of these measures were well documented and frequently used in long-term care-related research in Taiwan[23–26].

The researcher visited the facilities in person to explain the research content and obtained approval for the research. The content of the research was explained to each subject and an informed consent was signed prior to administration of the questionnaire. The structural questionnaire was completed by the participants if they could; the ambiguous questions, clarified by the researcher, were also answered by the subjects independently. As for those illiterate elderly who were not able to complete the questionnaire, the researcher would clarify all questions step by step and help them complete the questionnaire precisely. All subjects were visited by the same researcher to minimize the bias.

SAHS is scored between 0 and 6: 0–2 indicates low level of health; 3–4 indicates acceptable level of health; and 5–6 signifies high level of health. The scores on cognitive function scale (SPMSQ) range from 0 to 10: 8–10 indicates no impairment; 6–7 indicates slight cognitive impairment; 3–5 implies moderate cognitive impairment; and 0–2 indicates serious cognitive impairment. Daily activity scale (Barthel Index) scores range between 0 and 100: a score of 0–20 suggests total dependence; 21–60 implies heavy dependence; 61–90 indicates moderate dependence; 91–99 indicates slight dependence; and 100 indicates total independence. OARS-IADL ranges from 0 to14 points: 0–13 points indicates a need for various levels of assistance and 14 points indicates total independence. Depression scale (CES-D) ranges from 0 to 60, and the

Table 1
Descriptive analysis of demographic characteristics and correlated depression scales for the elderly participants in Taiwan, 2007.

Variables	Number of people (n)	%	Depression scale ($M \pm SD$)	Test values (t)	Test values (F)	Test values (R)
Gender				−1.91[a]		
Female	189	61.17	13.80 ± 7.85			
Male	120	38.83	15.47 ± 6.79			
Age	309					−0.13[a,*]
Birthplace	309			0.529[b]		
Non-native	172	55.66	14.65 ± 7.40			
Native	137	44.34	14.20 ± 7.61			
Religion				−2.06[b,*]		
None	86	27.83	15.86 ± 6.05			
Practice	223	72.17	13.91 ± 7.92			
Educational level					3.17[c,**]	
Illiterate	56	18.12	17.16 ± 7.53			
Elementary school	65	21.04	14.71 ± 8.26			
Junior high school	51	16.50	12.96 ± 7.15			
Senior high school	61	19.74	12.82 ± 7.43			
College and above	76	24.60	14.54 ± 6.55			
Marital status				0.825[b]		
Spouseless	249	80.58	14.62 ± 7.40			
Spouse	60	19.42	13.73 ± 7.86			
Economic conditions				-0.14[b]		
Government Sponsored	21	6.80	14.29 ± 5.37			
Self-funded	288	93.20	14.46 ± 7.63			
Duration of stay						−0.10[a,*]

$^{*}p < 0.05$.
$^{**}p < 0.01$.
ANOVA = analysis of variance.
[a] Pearson product−moment correlation.
[b] Independent Samples t test.
[c] One-way ANOVA.

score of 16 is the cut-off point for depression[30]. Social support scale ranges from 0 to 30 and consists of four categories, including social companionship, emotional support, instrumental support, and informational support. Leisure-activity participation scale ranges from 0 to 132, and higher score indicates more leisure-activity participation.

2.2. Statistical analysis

Data were collected from February 1, 2007 to May 1, 2007. The Statistical Package for the Social Science (SPSS) version 14.0 for Windows (SPPS Inc., Chicago, IL, USA) was used to calculate descriptive statistics. Descriptive statistics helped understand the demographic characteristics of participants. One-way analysis of variance (ANOVA), Pearson correlation coefficient, and multiple covariate regression analysis were applied to assess the correlation of variables as appropriate. For the multiple regression analysis, the dependent variable was health status measured by SAHS, SPMSQ, ADL, and IADL. The measures of social support, demographic statistics, and leisure-activity involvement that reflected objective and subjective dimensions were examined.

3. Results

Of the total 309 elderly residents agreed to participate in this study, the majority were females, accounting for 61.17% of the participants (Table 1). Most of the participants were non-native residents (55.66%) with various religious beliefs (72.17%). The overall mean age was 81.6 years. The education level of college graduate was dominant. Most of them have been staying in the long-term care facilities at their own expenses and the mean duration of stay was 5.5 years. Factors associated with depression were age ($p < 0.05$), religion ($p < 0.05$), education level ($p < 0.01$), and length of stay ($p < 0.05$). The overall average score of CES-D of the participants was 14.45 ± 7.49 (range 0−60). Approximately 63% of the participants did not respond to the depression section of the questionnaire in spite of having rating of depression (CES-D < 15), and the other 37% were evaluated to be depressed (CES-D ≥ 16).

Table 2 summarized the association between depression and health status, social support, and leisure-activity involvement. The mean score of SAHS obtained was 3.48 ± 1.99 (range 0−6), indicating an acceptable level of self-perceived health. Less cognitive impairment was observed, as indicated by the mean SPMSQ score of 8.72 ± 1.53 (range 0−10). The participants with a higher SPMSQ score accounted for 81.2% ($n = 251$, mean score 8−10), who were defined as having no cognitive impairment. The others with mild, moderate, and extreme impairment were 17.2% ($n = 53$), 1.6% ($n = 5$), and 0% ($n = 0$), respectively. Daily activity scale (Barthel Index) score was 98.61 ± 5.54 (range 0−100), suggesting a significant dependence on external assistance. The mean OARS-IADL

Table 2
Correlation between depression and variables of health status, social support, leisure-activity involvement ($n = 309$) in Taiwan, 2007.

Variables	($M \pm SD$)	Test values (R)
Health status		
SAHS	3.48 ± 1.99	−0.43**
Cognitive function scale (SPMSQ)	8.72 ± 1.53	−0.31**
ADL (Barthel Index)	98.61 ± 5.54	−0.24**
IADL	12.61 ± 2.14	−0.41**
Social support		
Emotional support	2.12 ± 2.20	−0.26**
Social companionship	2.43 ± 2.49	−0.34**
Informational support	1.72 ± 1.53	−0.30**
Instrumental support	1.82 ± 1.66	−0.18*
Leisure-activity involvement	27.20 ± 12.48	−0.50**

Pearson product−moment correlation.
* $p < 0.01$.
** $p < 0.001$.
ADL = activity of daily living; IADL = instrumental activity of daily living; SAHS = self-assessed health status; SPMSQ = Short Portable Mental Status Questionnaire.

score was 12.6 ± 12.13 (range 0–14), with 56.6% of research subjects reported total independence and the remaining 43.4% needed assistance.

The average score of social support scale was 8.09 ± 6.89 (range 0–30). Among the four categories of social support, the participants had the highest social companionship scores (2.43 ± 2.49), followed by emotional support score (2.12V2.20), instrumental support score (1.82V1.66), and informational support score (1.72 ± 1.53).

When exploring the relationship between demographic characteristics and depression, we found that depression occurred more often in the "younger" elderly, those without religious beliefs, illiterate participants, and the subjects not in the facility for a long time ($p < 0.05$, Table 1). Several factors were negatively correlated to depression, including better SAHS, full ability to perform IADL, active participation in leisure activities, and a high level of social support ($p < 0.01$, Table 2).

Regression analysis for the association between depression and measured variables was depicted in Table 3. Factors strongly associated with depression included low economic status, low self-perceived health status, low abilities to perform IADLs, low level of social companionship, and low involvement in leisure activities ($F = 13.2$, $p < 0.001$). The adjusted value of R^2 was 0.403, indicating that this whole model was able to explain 40.3% of the dependent variable (depression).

4. Discussion

The findings of this study were summarized as follows:

(1) Self-funded elderly residents in long-term care facilities had a higher depression rate than those in government-sponsored facilities.
(2) Elderly individuals perceiving better health conditions tended to be less depressed.
(3) IADL scores of these elderly were negatively related to their depression.
(4) In terms of social support, the factor with the highest impact on depression was social companionship. Therefore, a higher level of social companionship predicted the development of less depression.
(5) Frequent participation in leisure activity was positively related to a lower depression rate.

The overall depression prevalence in our study was 37%, which was much higher than that in the previous community-based studies in Taiwan (ranged from 12% to 29.5%)[31,32]. The finding of our study was consistent with many worldwide studies and reminded us to pay more attention to the elderly residing at the long-term care facilities. A higher prevalence of depression was found in self-funded elderly residents in long-term care facilities than in those in government-sponsored facilities. Our finding contradicted Wang's report that correlated the lower income level to the higher depression rate[33]. A possible explanation is that living in a public-sponsored institution was free of cost. The residents had no additional financial burden; therefore, they felt less guilty of bringing economic burden to their family or themselves and were more likely to be content with their current circumstances possibly[33]. Although self-funded elderly residents might have had higher incomes, in most cases, their children paid the costs for them in Taiwan. The elderly abandoned by their families did occur in the long-term care facilities in a few cases. Economic burden of payment for facilities might be an independent risk factor for the depression of elderly; however more studies are necessary to confirm our observation. We also humbly recommend to categorize the economic burden strictly into self and familial sources for further study design.

Elderly individuals with better SAHS score tended to be less depressed, although the true causal relationship is still unclear. The finding is congruent with the previous studies that proposed a negative correlation between SAHS and development of depression (Chiang HN. Relationship between severity of illness, self-perception of health, social support, and elderly depression in Taiwan [unpublished master's thesis]. Institute of Behavioral

Table 3
Regression analysis for the association of depression with factors including demographic characteristics, institutional characteristics, health status, social support, and leisure-activity involvement ($n = 309$) in Taiwan, 2007.

Variables	Original score Regression coefficient (B)	Standard error (SE)	Standardized regression coefficient (β)	t value	Adjusted R^2	F
(Constant)	38.57	8.43			40.3	13.20***
Female	1.02	0.73	0.67	1.39		
Age	−0.06	0.06	−0.04	−0.87		
Birthplace	−0.49	0.74	−0.03	−0.66		
Religion	−1.69	0.78	−0.00	−0.02		
Educational level	−0.53	1.06	−0.02	−0.50		
Marital status	0.40	0.88	0.02	0.46		
Economic status	2.86	1.47	0.09*	1.94		
Duration of stay	9.34	0.07	0.68	1.30		
Health status						
SAHS	−1.11	0.17	−0.29***	−6.27		
SPMSQ	−0.45	0.26	−0.09	−1.72		
ADL	−2.03	0.07	−0.01	−0.25		
IADL	−0.64	0.23	−0.18**	−2.75		
Social support						
Emotional support	4.76	0.25	0.01	0.18		
Social companionship	−0.55	0.24	−0.18*	−2.32		
Informational support	−0.22	0.36	−0.04	−0.61		
Instrumental support	0.38	0.29	0.08	1.30		
Leisure-activity involvement	−0.15	0.03	−0.25***	−4.51		

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.
ADL = activity of daily living; IADL = instrumental activity of daily living; SAHS = self-assessed health status; SPMSQ = Short Portable Mental Status Questionnaire.

Medicine of National Cheng Kung University, Tainan; 2004). We concluded a few possible reasons associated with less depression found in those elderly. Firstly, they had less physical problems to cope with. Secondly, given their better physical condition, they had more interactions with caregivers, other residents, and their family. They also participated in leisure activities so that they were less depressed, which was demonstrated in our results.

IADL scores of the elderly were negatively correlated to their depression in this study, which was consistent with previous reports[19,27]. A better IADL score generally means less limitation of activity and leads to less depression, which was supported by our findings and deserved more interventional studies. To improve IADL score by enhancing occupational therapy or rehabilitation might be an option to prevent depression in the elderly. In addition, better IADL scores might imply a better capability but not exactly strong enough, although they had less barriers, to participate in leisure activities or entertainment. It explains why some elderly had good IADL scores but low motivation to perform other leisure activities. It also suggests that those elderly should be categorized when conducting more studies in the future.

In terms of social support, the result showed that elder adults living in long-term care facilities had lower social support than those living in the communities with an average score of 10.9 (Lai KH. The study of social support, loneliness and leisure participation influence meaning in life of the elder—the research of elderly college in Taichung area [unpublished master's thesis]. Graduate Institute of Department of Leisure Services Management, Chouyang University of Technology; 2005). In addition, social companionship was shown to have the highest impact on depression. Higher-level social companionship was associated with the development of less depression. We observed that more frequent family visits substantially enhanced the emotional well-being of the elderly and improved their adaptation to the institutions. This finding corresponded with the previous reports that indicated social support, especially social companionship, could be a protective buffer against depression[31].

The result of a below-average overall score of social support was also notable. The option of "Caregivers comfort me when I feel down" had the lowest score, while "never" was the answer for 57% of the participants. In addition, the option "Caregivers listen to my feelings and concerns" obtained a negative response from 54% of the participants. Both examples illustrated poor interactions between the caregivers and the elderly. To improve the condition, caregivers must develop positive interactions with their clients by showing respect, treating them as family, taking initiatives to care for them, and paying attention to their emotional well-being as well as their basic needs. The above findings can easily be accepted, but further interventional studies are needed to confirm them. Before these studies can be conducted, it is certainly necessary to enhance companionship support through informing their families and friends about upcoming activities and encouraging family participation for these elderly to prevent depression.

Our finding demonstrated that the most influential factor associated with depression is involvement in leisure activities, which also corresponded with previous studies. Chen et al found that regardless of the type of leisure activities (interactive or noninteractive), frequent participation in leisure activities was negatively related to the depression rate[32]. Therefore, the elderly should be encouraged to take part in leisure activities for preventing them from developing depression. According to our experience, therapeutic or recreational activities should be individualized and customized. The facilities are suggested to make every effort to evaluate each resident's condition individually to determine what kinds of activities should be recommended to maximize the participation rate.

In summary, the following recommendations were made to long-term care facilities for the elderly:

(1) Improving interactions between caregivers and elderly residents
(2) Encouraging family visits and increasing social companionship, which can enhance the social support
(3) Enhanced occupational therapy or rehabilitation as an option to improve IADLs score and, thus, to prevent the elderly from depression
(4) Making every effort to evaluate all the residents' condition individually to determine what kinds of activities should be recommended to maximize the participation rate

This was a cross-sectional study derived from questionnaire investigation. Although the evidence strength was limited, it posed some possible interventional items that might be clinically valuable. Thus, further interventional studies with a larger size of participants and a longitudinal design to gain insight into the assessments over time should be conducted to confirm our recommendations.

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